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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/820,365	03/29/2001	Minoru Yonezawa	205187US2RD	2886

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EXAMINER

SPEARS, ERIC J

ART UNIT PAPER NUMBER

2878

DATE MAILED: 11/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/820,365

Applicant(s)

YONEZAWA ET AL.

Examiner

Eric J Spears

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 March 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement filed 9/29/2001 fails to comply with 37 CFR 1.98(a)(1), which requires a list of all patents, publications, or other information submitted for consideration by the Office. It has been placed in the application file, but the information referred to therein has not been considered.

Specification

✓ The spacing of the lines of the specification is such as to make reading and entry of amendments difficult. New application papers with lines double spaced on good quality paper are required.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

✓ The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

✓ The claims are objected to because the lines are crowded too closely together, making reading and entry of amendments difficult. Substitute claims with lines one and one-half or double spaced on good quality paper are required.

See 37 CFR 1.52(b).

Claim Objections

✓ Claim 4 is objected to because of the following informalities: on line 6, "staked" should probably read --stacked--.

✓ Claim 10 is objected to because of the following informalities: on line 1, "tpe" should probably read --type--. Appropriate correction is required.

✓ Claim 16 is objected to because on line 3, the use of the word "faced" in this sentence is awkward. Further, "electrodes" should read --electrode--.
Correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 12-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

✓ Claim 12, Lines 3-5 recites the limitation "the first or second transparent electrode of the first photodetector" and "the transparent electrode of the second photodetector ". There is insufficient antecedent basis for these limitations in the claim.

✓ Claim 13, Lines 4-5 recites the limitation "the transparent electrode of the second photodetector ". There is insufficient antecedent basis for this limitation in the claim.

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✓ Claim 14, Lines 4-5 recites the limitation "the transparent electrode of the second photodetector ". There is insufficient antecedent basis for this limitation in the claim.

✓ Claim 15, Lines 4-5 recites the limitation "the transparent electrode of the second photodetector ". There is insufficient antecedent basis for this limitation in the claim.

→ Regarding Claim 16, Claim 16 implies the limitation that the first and second photodetectors are placed on opposite (or different) sides of a substrate. This limitation directly contradicts the limitation of Claim 8 which recites that the second photodetector is stacked upon the first photodetector. Therefore, it is not possible to determine the true scope of Claim 16, and thus no art has been applied to Claim 16, 17, 19, 20, or 21.

✓ Regarding Claims 18 and 19, lines 2-4, it is not understood what the phrase "substantially equal areas symmetrically with respect to a point on the optical axis of the incident light" means or is intended to mean. Therefore no art has been applied to these claims as the scope of the limitations of these claims cannot be determined.

✓ Claim 21, line 4 recites the limitation "the electrical signal". There is insufficient antecedent basis for this limitation in the claim, as the previous line recites multiple signals.

✓ Further regarding Claim 21, the scope of the limitation imposed by this claim is unclear, as it is not understood how "the electric signal" recited on Line 4

can be derived from both the second and third electrodes when these electrodes are recited as belonging to different photodetectors.

Regarding Claims 16-21, no art has been applied to these claims as the scope of these claims is so unclear.

Claims not specifically mentioned are indefinite due to their dependency from an indefinite base claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Claims 8, 12, and 22 are rejected under 35 U.S.C. 102(e) as being anticipated by Theil (6,373,117).

Regarding Claim 8, Theil teaches a first transmission photodetector (262,264,266) configured to carry out a photoelectric transfer with respect to light in a first wavelength band including a predetermined wavelength; and a second photodetector (252, 254, 256), stacked on the first transmission photodetector,

configured to detect light passing through the first transmission photodetector (See Fig. 2; Col. 8, lines 31).

Regarding Claim 12, Theil teaches the transparent electrodes 240 and 258 are divided into multiple cells (See Fig. 2).

Regarding Claim 22, Theil teaches wherein a second wavelength band photoelectric-transferred by the second photodetector includes a longer wavelength component than that of the first wavelength band photoelectric-transferred by the first transmission photodetector (Col. 8, lines 1-26; Col. 3, lines 30-63).

Claims 8 and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Forrest et al. (6,278,055).

Regarding Claim 8, Forrest teaches a first transmission photodetector configured to carry out a photoelectric transfer with respect to light in a first wavelength band including a predetermined wavelength (80Xd); and a second photodetector (80Xc), stacked on the first transmission photodetector, configured to detect light passing through the first transmission photodetector (See Fig. 8).

Regarding Claim 11, Forrest teaches wherein the first transmission photodetector comprises: a first transmission electrode 802c; an organic p-type semiconductor layer stacked on the first transparent electrode 804d; an organic n-type semiconductor 803d layer stacked on the organic p-type semiconductor layer; and a second transparent electrode 802b stacked on the organic n-type semiconductor layer.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Theil (6,373,117).

Regarding Claim 1, Theil teaches a transmission photodetector comprising a first transparent electrode 268, a second transparent electrode 258, at least one of the first and second transparent electrodes being divided into a plurality of electrode cells (i.e. 258), and a photoelectric transfer part 262, 264, 266 sandwiched between the first and second transparent electrodes, the photoelectric transfer part being common to the plurality of electrode cells (Fig. 2; See Abstract; See Fig. 6; Col. 2, lines 20-42). Theil does not explicitly show the full structure of 2 photodetectors side by side. However, Theil details the use of active pixel sensors (which are well known to possess multiple pixels in the same photodetector) and Fig. 2 shows what is apparently the start of a second photodetector on the left hand side of the figure. This photodetector shares the same photoelectric transfer part and a transparent electrode with the main pixel shown. Alternatively, if this is not so, it would have been obvious to one of ordinary skill in the art to provide a pixilated photosensor wherein pixels share a

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common photoelectric transfer part between them, as such detectors are well known in the art as shown for example in Robinson (5,670,817), in order to provide easier photosensor array production.

Claims 2, 3, 5, 6, 9, 10, 13, 14, 23, and 24 rejected under 35 U.S.C. 103(a) as being unpatentable over Theil (6,373,117) in view of Hoffmann et al. (4,724,388).

Regarding Claims 2, 3, 9, and 10, Theil does not teach a sensitizing dye layer. However, Hoffmann teaches a photoelectric transfer part comprising: a sensitizing dye film absorbing light in a wavelength band including a predetermined wavelength; and a carrier transporting layer (which is also a dielectric layer) sandwiched between the sensitizing dye film and the second transparent electrode B (See Fig. 1; Col. 4, lines 1-21). Therefore, it would have been obvious to one of ordinary skill in the art to modify the device of Theil to include such a dye layer to provide for wavelength dependent photodetection, as such the dye layer photodetectors are well known in the art, in order to achieve wavelength dependent detector without the need for filters or other means.

Regarding Claims 5 and 6, Theil teaches a transmission photodetector comprising a first transparent electrode 268, a second transparent electrode 258, at least one of the first and second transparent electrodes being divided into a plurality of electrode cells, and a photoelectric transfer part 262, 264, 266 sandwiched between the first and second transparent electrodes, the photoelectric transfer part being common to the plurality of electrode cells (Fig. 2;

See Abstract; See Fig. 6; Col. 2, lines 20-42). Theil does not explicitly show the full structure of 2 photodetectors side by side. However, Theil details the use of active pixel sensors (which are well known to possess multiple pixels in the same photodetector) and Fig. 2 shows what is apparently the start of a second photodetector on the left hand side of the figure. This photodetector shares the same photoelectric transfer part and a transparent electrode with the main pixel shown. Alternatively, if this is not so, it would have been obvious to one of ordinary skill in the art to provide a pixilated photosensor wherein pixels share a common photoelectric transfer part between them, as such detectors are well known in the art as shown for example in Robinson (5,670,817), in order to provide easier photosensor array production.

Further regarding Claims 5 and 6, Theil does not teach a sensitizing dye layer. However, Hoffmann teaches a photoelectric transfer part comprising: a sensitizing dye film absorbing light in a wavelength band including a predetermined wavelength; and a carrier transporting layer (which is also a dielectric layer) sandwiched between the sensitizing dye film and the second transparent electrode B (See Fig. 1; Col. 4, lines 1-21). Therefore, it would have been obvious to one of ordinary skill in the art to modify the device of Theil to include such a dye layer to provide for wavelength dependent photodetection, as such the dye layer photodetectors are well known in the art, in order to achieve wavelength dependent detector without the need for filters or other means.

Regarding Claims 13 and 14, Theil teaches the transparent electrodes 240 and 258 are divided into multiple cells (See Fig. 2)

Regarding Claim 23 and 24, Theil teaches wherein a second wavelength band photoelectric-transferred by the second photodetector includes a longer wavelength component than that of the first wavelength band photoelectric-transferred by the first transmission photodetector (Col. 8, lines 1-26; Col. 3, lines 30-63).

Claims 1, 4, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forrest et al. (6,278,055) in view of Robinson (5,670,817).

Regarding Claims 1, 4, and 7, Forrest teaches stacked photodetector comprised of individual photodetectors. Each of these individual photodetectors comprises a transparent electrode, a p-type organic semiconductor, an n-type organic semiconductor (the two organic layers forming a photoelectric transfer layer), and another transparent electrode (i.e. (802c, 803d, 804d, and 805b) or (802a, 803a, 804a, and 805a) in Fig. 8A). Forrest does not teach one of the electrodes being divided into a plurality of cells. However, Robinson teaches a photodetector with multiple unit cells which all share a common electrode 26. Therefore, it would have been obvious to one of ordinary skill in the art to provide multiple stacked photodetectors, each as taught by Forrest, with a common electrode, as the use of common electrodes in detector arrays is well known in the art as shown by Robinson and since it has been held that the mere duplication of the essential working parts of invention involves only routine skill in the art, in order to eliminate the need for creating two separate electrodes for each photodetector cell. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Forrest et al. (6,278,055) in view of Robinson (5,670,817).

Regarding Claim 15, Forrest does not explicitly show the full structure of 2 photodetectors side by side with two photodetectors sharing a common electrode, although Forrest does teach making an array of detectors (Col. 31, lines 26-34). However, Robinson shows an array of detectors with a common electrode 26. Therefore, it would have been obvious to one of ordinary skill in the art to provide a pixilated photosensor wherein pixels share a common photoelectric transfer part between them, as such detectors are well known in the art as shown for example in Robinson (5,670,817), in order to provide easier photosensor array production by eliminating the need for patterning both top and bottom electrodes for each stacked photodetector.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Forrest et al. (6,278,055) in view of Robinson (5,670,817) and further in view of Theil (6,373,177).

Regarding Claim 25, the modified device of Forrest does not teach such a wavelength detection method. However, Theil teaches stacked photodetectors wherein a second photodetector detects light in a different wavelength band from the first photodetector. Therefore, it would have been obvious to modify the modified device of Forrest to provide a multiple color stacked photodetector, as

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such multiple color stacked photodetectors are well known in the art from Theil, in order to provide for full color sensing in the modified device of Forrest.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Nozaki et al. (4,677,289) teaches a color stacked photodetector.

Hamakawa et al. (4,820,915) teaches a color stacked photodetector.

Jack (5,097,128) shows a photodetector with dielectric layers.

Forrest et al. (6,365,270) teaches a layered color light emitting device.

Friederich et al. (5,313,058) teaches a photodetector.

Hayashi et al. (5,351,209) teaches a photodetector array.

Ogawa et al. (4,447,720) teaches an imaging sensor.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric Spears whose telephone number is (703) 306-0033. The examiner can normally be reached on Monday-Friday from 9:00am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on (703) 308-4852. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7724.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

EJS
10/27/02


STEPHANIE ALLEN
PRIMARY EXAMINER